IN THE CLAIMS:

The following list of claims replaces all prior listings and versions of claims in this application:

1. (Currently amended) A method of preparing a semiconductor wafer, which comprises:

providing a matching substrate that comprises a ~~creating a region of weakness in a matching substrate that comprises~~ handling substrate and a matching layer ~~with~~ on the handling substrate, the matching layer having a first lattice parameter on a first surface disposed opposite the handling substrate, and the handling substrate having a second lattice parameter that is different from the first lattice parameter;

creating a region of weakness in the matching layer, wherein the region of weakness is configured to facilitate splitting;

growing on the first surface of the matching layer a first strained layer of a first semiconductor material in a strained state to impart the same first lattice parameter in the first strained layer as in the matching layer;

associating a receiving substrate with the first strained layer to form a composite structure; ~~and~~

obtaining a product wafer and a donor wafer by splitting the composite structure at the region of weakness, wherein the product wafer includes the strained first layer and the receiving substrate and a retained portion of the marching layer on the first strained layer, while the donor wafer includes at least a portion of the matching layer;

smoothing roughness from the retained portion of the matching layer; and

selectively etching the smoothed portion of the matching layer from the first strained layer.

2. (Canceled)

3. (Original) The method of claim 1, wherein the matching layer includes a buffer layer and a relaxed surface layer on which the first strained layer is grown.

4. (Original) The method of claim 3, wherein the lattice parameter of the buffer layer is graded between the first and second lattice parameters.

5. (Original) The method of claim 1, wherein the region of weakness is created by implanting atomic species.

6. (Original) The method of claim 1, wherein the region of weakness is created by adding a porous layer.

7. (Original) The method of claim 1, wherein the lattice parameter of the first material when strained is different than the lattice parameter of the first material in a relaxed state.

8. (Original) The method of claim 1, wherein the receiving substrate is bonded to the first strained layer.

9. (Original) The method of claim 1, wherein the first strained layer is disposed directly adjacent an insulator on a side of the first strained layer on which the receiving substrate is disposed.

10. (Canceled)

11. (Original) The method of claim ~~10~~ 1, further comprising removing the retained portion of the matching layer from the first strained layer.

12-13. (Canceled)

14. (Original) The method of claim 1, wherein the first strained layer comprises silicon, and the matching layer comprises silicon germanium.

15. (Original) The method of claim 1, wherein the region of weakness is formed after the growing the first strained layer.

16. (Original) The method of claim 1, wherein the first strained layer is strained for modifying the energy band structure of the semiconductor material of that layer for improving the electrical properties thereof compared to the semiconductor material in a relaxed state.

17. (Original) The method of claim 16, wherein the first strained layer has a thickness that is less than the critical thickness thereof for preventing substantial relaxation of strain.

18. (Original) The method of claim 17, wherein first strained layer has a thickness of less than about 20 nanometers prior to the splitting.

19. (Original) The method of claim 16, wherein the first strained layer has a charge carrier mobility that is at least about 50% higher than in the semiconductor material in a relaxed state.

20. (Original) The method of claim 1, further comprising providing a first strain-retaining layer on the first strained layer for maintaining strain from the side of the first strained layer opposite the matching layer.

21. (Original) The method of claim 20, wherein the first strain-retaining layer has the first lattice parameter.

22. (Original) The method of claim 21, wherein the matching and first strain-retaining layers are made of substantially the same material.

23. (Original) The method of claim 20, growing a second strained layer of semiconductor material on the first strain-retaining layer to impart the first lattice parameter therein.

24. (Original) The method of claim 23, further comprising providing a second strain-retaining layer on the second strained layer and having the first lattice parameter for maintaining the strained state of the second strained layer from the side of the second strained layer opposite the first strain-retaining layer.

25. (Original) The method of claim 23, further comprising:

providing a region of weakness in the first strain-retaining layer;

transferring the first strained layer to a first receiving substrate by splitting at the region of weakness in the first strain-retaining layer; and

transferring the second strained layer to a second receiving substrate by splitting in the region of weakness in the matching layer.

26. (Original) The method of claim 20, wherein:
the first strained layer comprises first material; and
the first strain retaining layer comprises an oxide of the first material.

27. (Currently amended) The method of claim 20, wherein the first strained layer comprises silicon and the first strain-retaining layer comprises silica, and the method further comprising ~~bonding~~ associating the first strain-retaining layer ~~of silica to~~ with the silicon of the first strained layer prior to the splitting.

28. (Original) The method of claim 27, further comprising thickening the strained layer of silicon epitaxially after the splitting.

29. (Original) The method of claim 28, wherein the strained layer is thickened epitaxially after the splitting to a layer thickness of greater than about 40 nm.

30. (Currently amended) A method of preparing a semiconductor wafer, comprising:
providing a repeating pattern of first and second layers;
performing multiple transfers of portions of the pattern to receiving substrates to produce product wafers, each portion including at least one of the first layers.

31. (Original) The method of claim 30, further comprising:
creating regions of weakness in the second layers to facilitate splitting; and
splitting the pattern at the second layers for transferring the first layers.

32. (Currently amended) The method of claim 30, comprising:
providing a matching substrate that has a matching layer with a first lattice parameter on a first surface;
growing on the first surface of the matching layer a first strained layer of a first semiconductor material in a strained state to impart the same first lattice parameter in the first strained layer as in the matching layer;

providing a first strain-retaining layer having the first lattice parameter on the first strained layer for maintaining strain from the side of the first strained layer opposite the matching layer;

growing a second strained layer of semiconductor material on the first strain-retaining layer to impart the first lattice parameter therein;

creating a second region of weakness in the first strain-retaining layer;

associating a second receiving substrate with the strained layers to form a second composite structure; and

obtaining a second product wafer and a second donor wafer by splitting the second composite structure at the second region of weakness, wherein the second product wafer includes the second strained layer and the second receiving substrate, while the second donor wafer includes at least a portion of the first strain-retaining layer;

creating a first region of weakness in the ~~first strain-retaining layer~~ matching substrate;

associating a first receiving substrate with the first strained layer to form a first composite structure; and

obtaining a first product wafer and a first donor wafer by splitting the first composite structure at the first region of weakness, wherein the first product wafer includes the first strained layer and the first receiving substrate, while the first donor wafer includes at least a portion of the matching layer;

wherein the first layers of the repeating pattern comprise the strained layers, and the second layers of the repeating pattern comprise the strain retaining layers.

33. (Original) The method of claim 32, wherein the first region of weakness is created in the second donor wafer.

34. (Original) The method of claim 32, further comprising providing a second strain-retaining layer on the second strained layer and having the first lattice parameter for maintaining the strained state of the second strained layer from the side of the second strained layer opposite the first strain-retaining layer.

35. (Currently amended) A method of preparing a semiconductor wafer, comprising:

providing a matching layer, which has a first lattice parameter on a first surface of the matching layer, on a handling substrate, which has a second lattice parameter that is different from the first lattice parameter;

growing on the first surface of ~~a~~ the matching layer a first strained layer of a first semiconductor material in a strained state to impart the same first lattice parameter in the first strained layer as in the matching layer;

associating a receiving substrate with the first strained layer to form a composite structure; and

transferring the first strained layer from the matching layer to the receiving substrate by splitting the matching layer from the strained layer, such that the transferred strained layer is in a strained state and a retained portion of the marching layer is retained on the strained layer; and

smoothing roughness from the retained portion of the matching layer; and

selectively etching the smoothed portion of the matching layer from the strained layer.

36-44. (Canceled)

45. (New) The method of claim 1, wherein the first strained layer of the product wafer in a strained state.

46. (New) The method of claim 30, wherein the pattern comprises a first and second layer groups comprising, each comprising first and a second layers in substantially a same order, the first layers having substantially a same first configuration, and the second layers having substantially a same second configuration that is different from the first configuration.

47. (New) The method of claim 46, wherein each of the groups have substantially a same arrangement of first and second layers.

48. (New) The method of claim 46, wherein each group has only one first layer.